DOCUMENT RESUME

ED 026 529 08 VT 007 756

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Methods of Teaching Agricultural Occupations in Community Colleges and Area Vocational Schools. Final Report.

State Univ. of New York, Cobleskill. Agricultural and Technical Coll.

Spons Agency-Office of Education (DHEW), Washington, D.C.

Bureau No-BR-8-0008

Pub Date Aug 68

Grant-OEG-0-8-08008-1889(085)

Note-91p.

EDRS Price MF-$0.50 HC-$4.65

Descriptors-*Agricultural Education, Agricultural Occupations, Area Vocational Schools, Communication (Thought Transfer), Community Colleges, Curriculum Development, Educational Facilities, Educational Needs, Educational Objectives, *Educational Planning, Faculty, Inservice Teacher Education, Instruction, Leadership Training, *Post Secondary Education, *Technical Education, Work Experience

Identifiers-Regional Seminars Teaching Agricultural Occupatio

Twelve 3-day regional seminars were held from November 13, 1967 to June 14, 1968 to assist educators at the post-high school level to: (1) determine the need for agricultural programs, (2) plan and develop curriculums, (3) investigate supervised occupational experiences, (4) assist in the development of leadership characteristics, (5) evaluate facilities for instruction, (6) help train faculty for vocational-technical programs, (7) communicate with administrators, high school teachers, 4-year college faculty, and the general public, and (8) provide guidelines for agricultural-technical programs. The seminars were attended by 435 state supervisors of agriculture, teacher educators, state directors, and personnel in post-secondary agricultural institutions from 44 states and Washington, D.C. Some general conclusions were: (1) The public is demanding supervised occupational experience for students enrolled in vocational-technical education, (2) Students are receiving better instruction at the high school level, (3) There is a trend in post-high school curriculums for cooperation among the various vocational services, (4) There is increasing need for agricultural management ability, and (5) Areas served by community colleges should be large enough to support sound technical programs. (DM)

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BR 8-0008
PA-08

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U.S. Department of
Health, Education and Welfare

Office of Education
Bureau of Research

VT007756

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Howard Sidney
Agricultural and Technical College
State University of New York
Cobleskill, New York

August 1968

The research reported herein was performed pursuant to a grant award with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government Sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

ACKNOWLEDGEMENTS

The Morrell Act of 1862 provided legislation leading to the establishment of programs of resident instruction, extension education and research in agricultural subjects in four-year colleges of agriculture. The Smith-Hughes Act of 1917 resulted in a strong effective system of vocational education in agriculture for high school students and adult farmers. The 1963 Vocational Education Act broadened the assignment and responsibility of agricultural educators to serve all age groups including vocational and technical education in agriculture for students at the post high school sub-baccalaureate degree level.

Agricultural educators were alert to recognize the lack of information on the part of the faculty, general public, and leaders in industry, pertaining to the objectives of vocational and technical education, both in our high schools and technical training at the post high school level. The technological developments in agriculture and the expansion of off-farm agricultural occupations and specialized segments of agriculture created an increasing need for the semi-professional or technical employee who needed an education beyond high school, but less than that offered in the four-year college program. The apparent needs, as voiced by leaders in agricultural industries, resulted in agricultural educators holding national, state, and local conferences and workshops to formulate plans for technical programs in agriculture. Thirteen regional seminars were conducted under Project No. 8-0008. The objective of these seminars was to disseminate information and facts among educators on the essentials of teaching agricultural occupations in our community colleges, post high school area vocational and technical schools, technical institutes, and the technical divisions established in some four-year colleges of agriculture.

The author gratefully acknowledges the assistance and cooperation of Walton A. Brown, President, Agricultural and Technical College, Cobleskill, New York; the State Supervisors and Consultants of Agriculture; and Professors of Agricultural Education, for their assistance and leadership in planning, advising and implementing the seminars. Also, acknowledgement is given to the college presidents, deans, and faculty for their contributions in preparing professional presentations, panel and symposium participation, and leadership in constructive discussions.

Each of the seminars conducted as a part of Project No. 8-0008 was summarized by an agricultural educator seminar participant. Gratitude is expressed to each of these agricultural educators. They are:

W. A. Gadda, South Dakota
G. S. Guiler, Ohio
J. P. Clouse, Indiana
C. E. Bundy, Iowa
F. G. McCormick, Arizona
C. E. Beeman, Florida
M. Multanen, Oregon
F. Cox, Kentucky
J. T. Horner, Nebraska
W. H. Annis, New Hampshire
G. Z. Stevens, Pennsylvania
C. W. Wiegers,Jr.,Tennessee
T. R. Buie, Texas

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INTRODUCTION

The Problem

The fastest expanding institutions of education in the United States are the community colleges, technical institutes, and post high school area vocational-technical schools. Approximately 78 two-year colleges were established in 1967. It is estimated that nearly 100 two-year community colleges will be established in 1968. It is anticipated the two-year community colleges will continue to expand to meet the needs of high school graduates and others for continuing education for changing and emerging technologies. Many area vocational-technical schools have been and are being established to provide post high school technical education. Several four-year colleges of agriculture have already establsihed, and others are establishing, divisions of instruction for the Associate in Applied Science degrees in agriculture curricula.

The general public, school administrators, and agricultural educators have become increasingly aware of the capacities and interests of the two-year colleges, area vocational-technical schools, and technical institutes for developing programs of agricultural education. Most agricultural educators understand the objectives of vocational-technical education and they are accepting the responsibilities of leadership in developing agricultural curricula appropriate for the present and prospective clientele of their school service areas. The rapid expansion of the two-year colleges, area vocational-technical schools and technical institutes; the expressed desires of the people for post high school training for agricultural occupations; and a severe shortage of appropriately trained agricultural education teachers and administrators have established a need for programs directed at the problems of developing, conducting and evaluating programs of instruction in agricultural occupations at the post high school level. In response to this established need, numerous research studies, conferences, and teacher-training workshops have been conducted in the several states to prepare teachers and to develop appropriate curricula and training materials. A review of the research studies and the conference and workshop activities suggested a further coordinated attack on the problem of providing appropriately trained agricultural teachers and administrators was needed on a regional or national basis if post high school, sub-baccalaureate degree programs in agriculture were to be developed and conducted in an efficient and economical manner. Project No. 8-0008 was designed to assist educators at the post high school level to:

1. Determine the need for agricultural programs
2. Plan and develop curricula
3. Investigate supervised occupational experiences
4. To assist in the development of leadership characteristics
5. Evaluate facilities for instruction
6. Help train faculty for vocational-technical programs

7. Communicate with administrators, high school teachers, four-year college faculty and the general public.
8. Provide guidelines for agricultural-technical programs.

Need for Training Programs for Agricultural Occupations

There is evidence of an acute shortage in almost all areas for trained personnel in technical positions. The prosperity and welfare of our nation is dependent upon a healthy agricultural industry. The demand for graduates from vocational-technical programs in agriculture far exceeds the supply. Placement reports for graduates from technical programs in agriculture show a shortage of technically trained personnel in many agricultural occupations. The implications are that there will be a continued shortage of competent, trained personnel for agricultural occupations. The knowledge, interest and leadership of agricultural educators is needed to establish schools to serve students at the thirteenth and fourteenth year level.

The United States is the leading nation in the world as an economical and abundant producer of food and fiber. The total agricultural production in the country is the nation's largest and most vital industry. The management and operation of the nation's farms and agricultural businesses requires highly technical, competent personnel. The highly skilled technician is becoming increasingly important as a member of the scientific and management team. This is true in research, development, production, services, and all aspects of agriculture. Most of these prospective technicians and highly skilled workers will be seeking post high school programs in agriculture for occupational experiences and education.

Our educational institutions are changing. Even though we anticipate jobs for high school graduates in future years, there may be fewer opportunities, percentagewise, in the employment force for these students. At the same time there is greater emphasis in the four-year colleges on the third and fourth years of college, on graduate work and research. The explosion of new knowledge has caused a change in the education needed by the scientists and the graduates from the professional schools. These people often have little laboratory experience or practical application. This leaves a greater gap than ever before between high school graduates and the graduate from the university. This widening gap must be filled by programs of instruction offered in the post high school institutions. There is need for a better understanding on the part of school administrators and faculty as to the nature and value of the post high school vocational and technical programs. The agricultural technicians now graduating from these programs excel in farm production, in services to farms, in the processing and distribution area because they can perform actual technical duties based on an understanding of applied agricultural sciences as related to their work. The technological explosion which is continuing and the increased use of highly mechanized equipment and capital in lieu of labor is requiring the upgrading in all educational programs. This is resulting in an increased demand for "middle manpower". Agriculture is no different from other industries except possibly there is a greater need for the technician.

Colleges now offering programs of high quality that are truly technical education have no problem in placing students in excellent positions, returning good salaries. These people also have the background and the education to enable them to continue their training and to grow on the job. We find many advancing into higher positions, into places of leadership and responsibility in their various communities, and they have the satisfaction of success in their positions. There is no question about the need for post high school programs in agriculture. This includes the business of farming, technologies to support the farm businesses, processing and distribution of foods, the use of our natural resources and many emerging technologies.

Increased pressures from a growing population have brought to the front the place of fresh water fish farming, ocean fishing, and the use of our forests not only for timber but for recreation. There are unforeseen horizons for the technician in agriculture, all part of a challenging and exciting future for students and educators who understand vocational and technical education at the post high school level. Project No. 8-0008 was designed to bring this type of information into proper perspective, to enlighten educators to discover the need for teaching agricultural occupations, and to assist these educators in implementing programs.

Objectives

The general objective of Project No. 8-0008 was to expedite vocational and technical programs for agricultural occupations at the post high school level. More specifically, Project 8-0008 involved the holding of a series of regional or area seminars, or training programs, designed to provide the participants with the latest information on:

1. How to obtain data - to show the need for vocational and technical programs in agriculture.
2. How to establish a desirable academic climate - to encourage the upgrading and establishment of programs in vocational and technical education as needed in the various areas at the post high school level and to encourage orderly educational change leading to a better acceptance of vocational and technical education.
3. How to coordinate studies and reports on vocational-technical education for their more effective use.
4. How to use the curriculum guides published by the United States Office of Education, and other curriculum information, and to plan effective curricula according to the needs of professional and technical programs in agriculture at the post high school level.

5. How to apply new innovations to insure a smooth articulation from high school programs to post high school offerings.
6. How to use the most knowledgeable and best prepared human resources in offering assistance in the development and dissemination of information and procedures which would be helpful in promoting instructional programs of vocational and technical nature for agricultural curricula at the post high school level.
7. How to create interest in vocational and technical education for agricultural occupations using as a base other training workshops and conferences on vocational-technical education in agriculture.

Scope

The regional seminars were located and scheduled to encompass most of the states in the nation. Central locations, the availability of transportation by air and car,and the location of post high school programs in agriculture in operation,were considered in selecting sites for the seminars. Invitations were extended to the state supervisors or consultants of agriculture; professors of agricultural education; administrators of two-year colleges, technical institutes and area vocational schools; agricultural industry representatives; the heads of post high school programs in agriculture; and selected faculty. The state supervisors of agriculture, professors of agricultural education, and the administrators of post high school programs were asked to extend an invitation to the seminars to people in their states who were involved in post high school programs, or who would benefit from the seminars. This method proved to be satisfactory in that the training program was extended to include the key people in each state. In some instances the deans of four-year colleges of agriculture attended the seminars or sent a representative. There were some guidance counselors and other technical educators in attendance outside the field of agriculture. The agenda for the seminars was essentially as follows:

1. Determining the needs for programs
2. Curriculum development
3. Facilities for post high school programs
4. Faculty for post high school instruction
5. Youth leadership activities
6. Administration of post high school programs.

Findings

The seminar participants agreed that a vast need exists for strengthening, expanding, changing, and establishing programs of instruction in agriculture and for the related off-farm occupations at the post high school level. Agricultural educators need assistance in gathering data to determine what students must have. Information must be made available to parents, students, other educators, and the public, to establish a healthy attitude toward vocational technical education in the post high school programs.

There is a lack of understanding and philosophy among educators about technical education. The educators attending the seminars realize that this is the time to emphasize post high school programs in agriculture. Changes in education, and the rapid development of the two-year institutions and programs serving students between high school and the four-year colleges makes it a necessity to cultivate programs according to the needs of the various areas. There is a deep and sincere interest on the part of educators at the local level to learn more about post high school programs in agriculture and how they can be successfully administered.

Implications for Future

Post high school programs in agriculture will experience rapid expansion and growth in the next decade. The programs at the post high school level will be an integral part of our educational system. This will lead to changes, innovations, and a closer working relationship between high school educators, the post high school people, and four-year colleges. We have a limited number of educators in this country with experience in post high school education. The faculty and administrators on the local level will need workshops, conferences, seminars and other means of communication in order to learn to work together to provide sound programs of instruction. Competent and knowledgable leadership must be made available at the state and national level to guide vocational-technical education. Men with successful experiences and backgrounds will be needed at the post high school level to interpret the philosophy of technical education, the occupational oriented programs, and to promote the understanding of the applied sciences in the vocational and technical curricula. Educators on the local level are interested in the specifics as to how to produce programs of excellence without the use of educational jargon sometimes dominating professional conferences. There is much to be done in the post high school programs in curriculum development, facilities, teacher education, research, evaluation of programs, and the total gamut. There is an exciting challenge ahead for educators interested in post high school programs in agriculture.

METHODS

Selecting the Participants, Program Content, and Sites for the Seminar

Each seminar was planned and located so as to serve as many agricultural educators as possible. Men in positions of responsibility in agricultural education were consulted regarding desirable seminar locations, program content, and the selection of participants interested in post high school programs in agriculture. Steps taken in planning were:

1. Consulted with Neville Hunsicker, Chief, Agricultural Education, as well as federal program officers, DVTE, to determine location of seminars to serve all states.
2. Contacted the chief state supervisor of agricultural education in the states within the area selected for a seminar to request advice regarding a college or institution to host the seminar. Also determined the most desirable dates for each seminar to eliminate major conference conflicts.
3. Contacted the head of vocational-technical education(or the agricultural program) in the institution selected to hold the seminar and invited this person to be coordinator and host for the seminar.
4. After completion of arrangements for all seminars, published a schedule which was distributed to the head state supervisors, heads of teacher education programs, seminar coordinators, and which was released for publishing in the Agricultural Education Magazine. (Appendix A.)

Conducting the Seminar

The seminars were planned to actively involve all participants. This was accomplished through the following procedures:

1. Invited participants were requested, in advance, to prepare a presentation to be given at the seminar. (See Appendix B.)
2. Approximately 60 days prior to each seminar invitations were forwarded to selected participants. These included a roster of all invited participants, and extended to administrators the privilege of inviting additional faculty who would benefit from the seminars. (See Appendix C and D).
3. Informed seminar coordinators of their responsibilities. (See Appendix E.)
4. Prepared write-ups to supplement seminar presentations and discussions (Appendix F, Curriculum Development; Appendix G, Faculty; Appendix H, Facilities; Appendix I, Reference). Write-ups disseminated at the seminars but not included in this report were on Vocational-Technical Education, Supervised Occupational Experience Forms, Youth Leadership Organizations, and Determining Needs for Programs.

5. In advance of each seminar, consulted the chief state supervisor of agriculture requesting his assistance in planning a visit to post high school programs in the state prior to the seminar. The itinerary frequently included a high school department of agriculture and a four-year college of agriculture. This gave the seminar leader an insight into programs in the state as well as an idea of the plans for development of vocational-technical programs in agriculture.
6. Seminar expenses were paid by each participant.
7. The seminar leader worked with the coordinator in finalizing the program and scheduling speakers,in advance of the seminar. Panels, symposiums, presentations, and discussion periods were planned in advance. A professor of agricultural education was invited, at the opening of each seminar, to prepare a summary highlighting the discussions, this summary to be given at the conclusion of the seminar.
8. Seminar participants were requested to evaluate the program and these evaluations were valuable in conducting seminars throughout the year. These evaluations were also valuable in summarizing educators' critiques.

Follow-Up Activities

Participants were encouraged to continue the discussions on post high school programs in agriculture in their respective states and communities.

The seminar leader also took part in the Tri-State Conference for Connecticut, Massachusetts, and Rhode Island held at the University of Rhode Island in June of 1968. He spoke on the topic of "Post High School Programs in the Country". He also served as a consultant on this topic at the Professional Growth Week Conference for the state of Wisconsin,held at Wisconsin State University, Stevens Point, Wisconsin, August 19-23, 1968.

The seminar summaries and evaluations have been utilized to tabulate the results and findings. Sharing the proceedings from the seminar may be valuable to the participants and other educators who are interested in vocational and technical programs in agriculture. The location and position of the 435 participants is shown on Table I.

TABLE I

State	State Supvr. of Agric.	Tchr. Educ.	State Dir. Presidents Deans Administrators	Head Agric. Faculty	Other	Total
Alabama	2	1				3
Alaska						0
Arizona	2	2	1	10		15
Arkansas	3	1	3	4		11
California						0
Colorado	2	2	6	7	2	19
Connecticut				2		2
Delaware						0
Florida	6	2	1	8		17
Georgia	6	1	4	9		20
Hawaii						0
Idaho	1	2	1	2		6
Illinois	4	3	5	18	1	31
Indiana	1	1				2
Iowa	5	2	6	8	4	25
Kansas	1	1	1	5		8
Kentucky		1				1
Louisiana						0
Maine	1		3	1		5
Maryland	1	2	1	2		6
Massachusetts			2	4		6
Michigan	1	1	3		1	6
Minnesota	2	1	14	19		36
Mississippi	7	1	5	6	3	22
Missouri	2	1	3	5		11
Montana				2		2
Nebraska	1	1	1			3
Nevada			1			1
New Hampshire	1	1	3	7		12
New Jersey		1				1
New Mexico		1		1		2
New York		1	1	5		7
No. Carolina	4	2	13	18	1	38
No. Dakota						0
Ohio	1	1	3	4		9
Oklahoma	1	1	1			3
Oregon	2	1	1	8		12
Pennsylvania	1	1	1	1		4
Rhode Island	1	1				2
So. Carolina				5		5
So. Dakota	1	1				2
Tennessee	3	1	4	1	1	10
Texas	1	3	6	15	1	26
Utah	1	2	1	1		5
Vermont	1			2		3
Virginia	1		2	1		4
Washington	1	1	1	2		5
Wash. D.C.			2	1	1	4
W. Virginia	3	3		9		15
Wisconsin	1			4		5
Wyoming	1	1	1			3
Totals	73	47	103	197	15	435

SUMMARY OF SEMINAR DISCUSSIONS

Results and findings of the Project are presented in the form of a summary of seminar discussions on the objectives of: Vocational-Technical Programs, Determining the Need for Programs, Curriculum Development, Instruction, Facilities, Faculty and Communications to Support Programs.

Objectives for Vocational-Technical Programs

1. A philosophy of vocational and technical education and understanding of the objectives is a prerequisite to developing curricula meaningful to students.
2. Vocational education is a method or type of instruction where emphasis is placed primarily on skill development and the preparation for direct entry into employment. Technical education is a level of vocational instruction where emphasis is placed on skill development, understanding of principles,and the application of the sciences. Greater mental activity and in-depth instruction are required in technical education. Both vocational and technical programs are occupationally oriented.
3. A widely accepted definition of an agricultural technician is "An agricultural technician is a worker located between the skilled worker and the professional in the job classification structure in his work performance and in his educational attainment. He possesses the skill and ability, working independently or with minimal supervision from a professional, to analyze and interpret information, diagnose problems, to make decisions, to make practical application of theoretical knowledge in performing specific tasks in a specialized field in the production, processing, distribution, or marketing of goods and services in agriculture. He must exercise cognitive skills primarily, but also must be able to supervise and perform manipulative skills."
4. Some characteristics of vocational and technical education are: it provides education and training for positions not requiring a baccalaureate degree; technical curricula usually require the prerequisite of greater depth in academic achievement than vocational programs; the course of study for the technician is rigorous, requiring the mastering of applied communication arts, sciences as related to the technology. These are all inter-related and are made meaningful and useful by the inclusion of supervised occupational experiences as an integral part of the training. Due to the depth and length of technical curricula, they are usually located in the post high school institutions of less than a baccalaureate degree. Many post high school programs supplement vocational training received in the high schools and also the high school academic graduate may be served.

Determining Need for Programs

1. In this country, approximately 65% of the seventh graders go on to graduate from high school. Of those students who start high school, 40%, upon graduation, will enroll in a four-year college, however, only 15% to 20% of those starting starting high school will complete a baccalaureate degree. Many of our high schools emphasize preparation for almost every student to enter four-year colleges. Actually, many of these students in our high schools need vocational courses, and vocational-technical programs in the post high school institutions.
2. Agricultural educators are aware of the increase and change in technologies in agriculture, and the necessity to prepare graduates for emerging technologies. Changes in technologies have created a need for post high school programs for many students. People interested in programs at the post high school level, but of less than a four-year degree, are not being served in some areas of our country.
3. The unskilled workers and the university graduates cannot fill demands at all work levels in our society.
4. Providing baccalaureate degree programs for all occupations is not essential, and not desirable.
5. Many job classifications in agriculture and the natural resources do not require four-year college graduates or people with university training.
6. There are positions requiring a technical education which could be entered by people with baccalaureate degrees, however, these people could become dissatisfied because they would not be utilizing their entire education. The placement officers in institutions now offering technical education in agriculture site a great need for graduates. There are many more jobs available then there are people trained to fill the jobs.
   Examples: in the fields of agricultural equipment, grain elevators, agricultural sales and service, farm managers and supervisors, ornamental horticulture, ranching, marketing, forestry and wood utilization, soil, water and wildlife conservation - and in the management of pa[illegible]nd recreational lands.
7. The production agriculturalist is part of the key clientele for post high school vocational technical education.
8. It is estimated that 16,350,000 people were employed in all farm agricultural occupations in 1965, and that this number will increase by 20% to 19,360,000 by 1970. Thousands of these people require knowledge and skills in agriculture for successful job performance.

9. The demand for agricultural technicians continues to increase as the result of changes in our high schools and universities. There are jobs for high school graduates from vocational programs, however, percentage-wise this number may decrease in the future. The four-year colleges are putting greater emphasis on the third and fourth year, graduate work and research with a trend toward more generalization, increased time spent on liberal arts in the agricultural colleges, less on technical or applied sciences. The graduate from the four-year college has an understanding of principles and theory but little of the practical application. He is dependent upon the assistance of technicians to actually perform the operations and understand the application of the principles to the world of work. This changing pattern is increasing the importance of and need for technical programs in agricultural and natural resources.
10. Needs must be determined on the local and state level. Sources of valuable information are: surveys by teachers of agriculture, census data, follow-up study of graduates from technical programs, a few selected capable and knowledgeable advisory members, professional surveys, state employment service, studies already completed by the land grant colleges and foundations, professors in the four-year college, the extension service and groups of organized businessmen or industrial associations.
11. In the final analysis need will be determined by: (a) needs of the industry and willingness of employers to reward graduates relative to their education (b) student interest in the industry and curriculum offering (c) a course of study for the technology so that students graduate with competencies for successful entry into the employment market.

Curriculum Development

1. There is a need to develop curricula on a state basis, however, final responsibility must be assumed by an individual in a leadership position. Leadership and cooperation will result in a master plan for vocational-technical education in the state encompassing all vocational-technical services working for the same objectives. This will also facilitate liaison groups and the effective use of curriculum specialists.
2. The philosophy of vocational and technical education must be continuously evaluated to determine the role of the technical programs and if they are being administered and operated relative to the objectives.
3. If we in education do not provide training programs for vocational-technical education, other agencies will provide the service.
4. We need to differentiate between curriculum and specific courses of study. We cannot and do not need to teach all things in every institution.

5. We must remember that we are teaching individuals and preparing them for some technical positions which do not exist today.
6. In addition to gathering data, taking surveys, and obtaining information for curriculum planning, we must be willing to use innovations, to accept challenges, and to even take a few chances in using vision for the future. Programs of instruction today are to prepare students who will be working in 1980 and even beyond the year 2000. The amount of time, or percent of the curriculum devoted to related instruction, i.e., the applied communication arts, sciences and mathematics, will vary with the technology and the occupational goal.
7. The sequence of courses, and the experiences in technical curriculums are extremely important.
8. Educators, both vocational, technical, and academic, tend to drift away from the objectives of vocational-technical education. The activities in the classroom and laboratories and the learning experiences must be occupationally oriented, and must include communication arts and the sciences. It is of utmost importance that technicians understand the whys and hows as well as where to find the answers in problem solving.
9. In some instances institutions are planning facilities and hiring faculty for vocational-technical programs prior to curriculum development. This results in having to offer curriculums according to the facilities available, as well as curriculums offered according to personal faculty interest. Programs of instruction, to be successful, must be soundly based on the needs of industry, the interests and desires of the students - and not necessarily what the instructors desire to teach.
10. In developing curriculums time can be saved by using the curriculum guides being made available through the efforts of the U. S. Office of Education. For information on how to secure the curriculum guides, write to Neville Hunsicker, Chief, Agricultural Education, U. S. Office of Education. At the present time, guides are available for Ornamental Horticulture, Food Processing Technology, Agricultural Equipment Technology, Forestry Technology, Grain, Feed, Seed and Elevator Technology, and Crop and Vine Technology.
11. Whenever possible, allow flexibility in individual student scheduling to allow for individual differences. The objectives of the programs, however, still must be met. Curriculums should be tailored to meet the local needs, and the special needs of a particular occupation. It is not advisable to copy existing curriculums in their entirety.

12. In developing technical programs in agriculture in this country there has been a tendency to overlook the business of farming. Only a small percent of the graduates from the four-year colleges of agriculture are entering farming. The one most important factor in successful farming today is "management". An education beyond high school for the young men and women of today and those of the future is necessary for successful farm management. The technical curriculums can prepare and are preparing graduates for the business of farming.
13. A technical program should not be initiated entirely based on the popularity for the curriculum. Curriculums should be established on a sound demand from industry for trained employees at the technical level.
14. Consider implementing programs for disadvantaged students.
15. Advisory Committees from industry can offer valuable assistance in providing ideas for curriculum content.
16. Evaluations made by Advisory Committees and by students can be valuable in strengthening curriculum content.
17. If both vocational and technical programs are offered in an institution, it is usually advisable to have separate classes or laboratories for these vocational and technical programs.
18. Curriculums must constantly be evaluated and adjusted when necessary to meet the changing conditions. This must be a current and never-ending process as graduates must have the competencies needed for employment. The curriculum content should provide education for immediate placement into employment for the graduate and should be a basis for continuing growth and development during the working years.

Instruction

Instruction for post high school programs is implemented by (a) lectures and laboratories (b) supervised occupational experiences, (c) activities to develop leadership characteristics.

(a) Lectures and Laboratories

1. The instructor will use lectures, discussions and laboratory experiences, as well as outside assignments.
2. Because of the nature of technical education, laboratories will be used extensively to teach the application of principles and the sciences. Two-, three- and four-hour laboratory periods will be common for each lecture or discussion period. Sophisticated testing equipment, modern machinery and testing devices will be used in the laboratories so that students have the opportunity to interpret findings and perform in the field of specialization. Livestock, plants and equipment will be utilized in the laboratories on the college farm as well as in the greenhouses and shops, to give students first hand experiences.

3. Students will complete outside assignments using the learning process for finding answers, problem solving, and extensive use of a library supplied with technical pamphlets and publications and suitable references according to the curriculums.
4. If possible, students should study and work under a number of different teachers. This increases the exchange of ideas and gives broader concepts in learning to work with people.
5. The technology of agriculture is the application of the sciences to the area being studied.
6. Administrators must think in terms of the number of students and courses a vocational technical teacher can handle and still remain an effective teacher. Many courses are such that an instructor cannot accommodate a large number of students in the laboratory due to the nature of individual instruction in the application procedures, also the safety of the student must be considered in shops using motors and large equipment. Adequate laboratory facilities must be available to the instructor. A program cannot be a warmed-over high school curriculum or it will fail through lack of acceptance from the students and from the employers. At the same time, the instruction cannot be identical to that in a four-year college. Normally the students are at a different maturity level and the objectives of vocational technical education differ from those of the baccalaureate degree course of study.

(b) Supervised Occupational Experiences

1. Educators are in agreement that supervised occupational experiences should be an integral part of the instructional program. There is no "best" recommended system for the supervised experiences. Some instructors may avoid occupational experiences (even though they are widely accepted as necessary and valuable, and are well-received by employers and educators).When both parties understand the operation of, and the part played by, supervised occupational experiences in the total curriculum, these experiences have proven to be most valuable.
2. Occupational experiences are basic to sound vocational-technical education. The setting has changed from supervised farm practice to laboratory job-oriented experiences in the post high school institutions.
3. Laboratory experiences will serve a valuable function, but will not replace supervised, job-oriented, occupational experiences.
4. The programs are an excellent means of acquainting people with vocational technical curriculums.
5. Adequate supervision is the key to effective occupational experience programs.

6. Supervised occupational experience programs must be timely (based on seasonal sequence) so that experiences are adapted to the technology.
7. Supervised occupational experience programs provide excellent opportunity for the development of personnel relationships needed by students for success on the job.
8. The programs permit the students by first hand contact to become oriented to the physical aspects of the job.
9. The programs permit students to use facilities, equipment, and tools which may not be available in the school laboratory.
10. Part of the supervised occupational experiences should be obtained early in the educational program. This results in better understanding on the part of the students and more effective results in the class and laboratory.
11. Experience in several training centers may be better than in one location.
12. Most educators recommend that students receive pay. It is usually considered advisable for students to start at the minimum wage with advances in salary as earned. This provides motivation toward good performance and is a desirable teaching technique. The supervised occupational experience may be for a quarter, a full semester, between semesters, or at specific times in accordance with curriculum needs and local conditions.
13. The programs must be a part of the instruction and well-coordinated. They should be supervised by the instructor and time must be allowed in the teaching schedule for faculty supervision.

(c) Activities to Develop Leadership Characteristics

1. Educators are in agreement that the most appropriate method of providing an atmosphere where leadership and personal improvement skills can be practiced is through student organizations made up of individuals with common interests such as those students enrolled in agricultural programs.
2. Youth organizations in vocational-technical programs should not be an extension or continuation of the Future Farmers of America.
3. The youth organizations must have worthwhile activities which will contribute to the individual's occupational goals. These activities must go beyond those which are normally part of class and laboratory instruction.
4. Existing organizations in the post high school institutions represent curriculum fields such as Ornamental Horticulture, Hoof and Horn, Agricultural Equipment Clubs, Conservation, and others.
5. It is apparent that there is interest and a growing movement for students with a common interest in agriculture to be served by one overall student organization in the post high school institutions. The main purpose of such an organization would be to provide opportunities for leadership and personal development.

6. Success of youth organizations in the post high school institutions depends on both student and faculty interest. The nature of two-year programs and the relatively short duration of enrollment for the student means that the high turnover requires the attention of permanently employed faculty.
7. There are many local clubs and organizations in the post high school institutions now serving the students. There is a movement in some states to organize on a state level for national leadership, however, the students will need the assistance of state and national agricultural leaders, and this leadership should come from agricultural educators. Most educators attending the seminars felt that the establishment of youth organizations should be derived from the grassroots. In areas where this has already happened there appears to be frustration on the part of local and state groups who would like to benefit from a national organization. This frustration is leading to some organizations going in different directions rather than pointing to one united organization. Experienced educators in this field of leadership have stated that such organizations and clubs will not have a voice in obtaining their objectives unless they unite for one organization which can be recognized and heard by the leaders in industry, government, and education. The time has arrived for action on a national level.

Facilities

1. Laboratory facilities are necessary for teaching. Laboratory facilities found in some of our post high school institutions are very inadequate. They are not comparable to some found in the high schools, and are not suitable for teaching vocational and technical courses at the post high school level.
2. Laboratory facilities are needed according to the specific courses being taught. Students in the vocational and technical courses must be able to actually apply what they have been studying in the classroom or doing with individual assignments. Instruction cannot be purely lecture. The laboratory facilities must be readily available at the time needed. This is the reason that livestock, plots of vegetables, forage crops, plants, greenhouses, food processing equipment, soil testing laboratories, diesel and hydraulics laboratories, power equipment laboratories, drafting rooms, and such must be available for the instructor. It is impossible to arrange for the use of these facilities through industry. It is not always possible to teach, using learning processes we know to be important, unless these facilities are owned and available through the school.
3. It is important to identify programs of instruction before planning facilities. Some older facilities are inadequate and it is impossible to remodel them to suit emerging new programs or those programs which should be established in the school.

4. Some specific laboratory facilities may be made available through cooperating with industry. The availability of adequate facilities is one of the necessary requirements to produce programs of excellence for vocational and technical education at the post high school level. (See additional information in Appendix II)

Faculty

1. Faculty must be specialists to assure quality programs. They must possess "expertise" in their subject matter area and their vocational teaching ability.
2. Teacher education must become more innovative. Instructors need to understand and apply principles of vocational-technical education in their instructional programs.
3. Faculty selection must be based on professional and experienced preparation in the area of specialization.
4. Administrators should consider employing assistants to maintain facilities and assist in the instruction of students. Assistants might be titled laboratory aids, technical assistants, laboratory assistants (but not faculty). Faculty must have acquired the professional preparation and degrees necessary to warrent the title.
5. To stay abreast of technologies, it is important that faculty attend professional meetings relative to their field.
6. Faculty must make an effort to maintain rapport with agricultural people in the state.
7. Faculty need a "generalist" who knows and understands vocational education and who has had successful experience in planning, organizing and administering sound vocational-technical programs. The "generalist" or administrator of the agricultural program must be on an administrative level to have a voice in directing programs. After the administration has been secured, subject matter specialists steeped in the concepts of vocational-technical education are essential if quality instructional programs are to be maintained. The specialist must be an expert in his subject matter, and must have teaching ability, enthusiasm, and the desire to produce. It is equally important that these specialists have the opportunity and desire for additional experience in industry and professional improvement to keep abreast of changing technologies. A workable, sabbatical or ~~load~~ LEAVE plan is highly desirable.
8. The specialist in technology should be oriented to and aware of the importance of working with the total faculty in vocational education in the institution as well as faculty in the academic areas of English and the sciences. It is important to have the "total concept" of the college for the total development of the students.

9. Colleges and universities preparing teachers for vocational-technical education might well consider (as a learning process) supervised occupational experiences for teachers. There is one line of thought that most technical teachers should come from industry, with little regard to professional preparation, and

then we have the other aspect of those leaning heavily toward professional courses in preparation for teaching. To determine the type of experiences required and the amount of time needed by teachers for professional courses as well as ways to gain industrial experience without spending a number of years in business is an area open to research.

10. There are competent college graduates available to teach technical programs if we are willing to take the time to discover them. We should examine the roster of graduates in the college placement offices, those who have entered industry, individuals who have changed from teaching to industry, men and women teaching in the high schools, and those working in graduate schools. By examining qualifications, backgrounds, and interests, capable people can be discovered who would be interested in vocational-technical education if they learned of the potential in the field and the interesting work. Teacher educators in our universities can then provide the in-service training programs to assist these individuals to become qualified, capable instructors.
11. Retention of faculty depends upon enjoyment of teaching, administration, salary and benefits, living conditions, opportunity for advancement, the environment in the institution and the facilities available, the curriculum, and the philosophy of all concerned.
12. Teachers of vocational-technical programs must challenge the interest of students. They must know how to teach and be able to communicate with students. The teachers must be able to work as a team, and it is important that the teacher enjoy his work.
13. The teacher must be professional in all respects to his work if he desires status in the eyes of the public, the faculty and students, as a professional and he must have a burning desire to teach. The teacher must possess the ability to organize his thoughts and efforts and to look outward as well as inward. Teachers sometimes serve programs instead of students. It is also important for the instructor to be active outside the school system.
14. Some teachers in two-year colleges apparently feel a lack of status and prestige. This results from not knowing their job and not actually producing in the institution.

There is unlimited opportunity for qualified, enthusiastic teachers who are willing to work in post high school education. (See Appendix G for further information).

Communications to Support Programs

Continuous communication with many different individuals and groups should be one of the objectives of the vocational-technical instructors at all times. This is one area where the work is never completed.

1. Cultivate desirable relationships with high school guidance teachers, high school and college faculty, and administrators in the institution.
2. Work closely with the high school vocational teachers on articulation of programs, career days, and other activities desirable in the community.
3. Include parents in some of the programs.
4. Keep other agricultural workers informed and involved, such as agricultural extension people, farm organizations, and people in agricultural businesses.
5. Use radio, television, newspapers, magazines, professional publications, to keep people informed.
6. Take part in or consider the service clubs in the community.
7. Maintain good relationships and open door communications with the four-year colleges and universities.
8. Keep facilities clean, modern, up-to-date, and in order at all times.
9. Faculty offices, laboratories and shops may be the only places some visitors observe in the institution. It is important that these facilities be conducted as a place of business, well-organized, and "the front door" to the program. There is no room for sloppy, disorderly, ill-kept facilities. This is one of the ways to lose support for vocational-technical programs.
10. When faculty are selected to teach vocational-technical courses, they should be made aware of the importance of having the support of students, parents, high school people, college people as well as their colleagues. A good teacher without support may fail to have the opportunity to become effective as an instructor.

EVALUATION REMARKS BY SEMINAR PARTICIPANTS

The following are direct quotations from evaluations submitted by seminar participants. An effort has been made not to duplicate ideas.

1. Would like additional workshops on "how" in specific areas such as curriculum development or course preparation.
2. Plan seminar to climax with specific suggestions of value to participants.
3. Educators can make better use of advisory committees.
4. It is important to keep vocational-technical teachers and the public occupationally oriented.
5. The seminar should allow more time for questions and discussions by limiting lectures and presentations.
6. Less time should be devoted to terminology such as "vocational" and "technical".
7. Information on the use of in-service "microscope" training for teachers.
8. The emphasis and importance placed on supervised occupational experiences.
9. Teacher-education should include both the vocational and experience aspects of the program.
10. Youth organizations can be valuable when meeting the objectives of the program.
11. It is important for the speakers to adhere to the subject assigned at the seminar.
12. Faculty desire help in developing sound supervised occupational experience programs.
13. We need a system for more exchange of materials and ideas among teachers in vocational-technical programs.
14. A better and more thorough understanding was acquired of vocational-technical programs at the post high school level.
15. Interesting to learn how programs have been developed at the post high school level in different states.
16. There is a need for continuous evaluation of programs.
17. In the initial planning of the seminar, a request for participants to bring materials to exchange.
18. The emphasis at the seminar on the selction of faculty.
19. The faculty participants prefer resource people with experience with an opportunity to discuss presentations instead of work groups and report writing.
20. Vocational and technical have a different meaning even though both are occupational.
21. Conferences and seminars should involve more administrators, guidance teachers and faculty outside the field of agriculture. The exchange of ideas would be valuable to all.
22. The supplemental data and information provided at the seminar was useful.
23. A better understanding of the need for post high school programs and their place in the total educational structure.
24. A better understanding of the philosophy of vocational-technical education.
25. Prefer the short two or three day conferences and workshops with a busy schedule and productive results.

26. Need to upgrade some vocational and technical curricula and to title them for what they are doing for students. The terms vocational and technical are being misused in some instances to gain financial support.
27. Keep seminar at "round table" type discussion.
28. This type of seminar was greatly needed and appreciation was extended to the U. S. Office of Education for making the programs available.
29. Include more individuals from industry in workshops of this type.
30. This was the only conference attended in years where those on the program did not read their presentations. Congratulations to the speakers.
31. The absence of pressure and the willingness to change the agenda within the objective and time allotted.
32. The need for leadership in the organization of post high school activities on a state and national level.
33. The emphasis on the different levels of training in vocational-technical education, and the importance of the relationship between high school programs, post high school programs, and the universities -- and that they are all equally important in agricultural education.
34. The timing of the seminars was excellent in that many post high school programs are in the developmental state or will be emerging in the next few years.
35. A seminar of this type with exchange of ideas is a tremendous technique of learning. This is a two-way process of listening and responding, giving and receiving. Hold frequent seminars for administrators of the programs, similar workshops for faculty.
36. Visit successful student placement situations as a part of the seminar.
37. Continue the seminars using people involved in the programs. Share the thoughts, problems, ideas and suggestions from the seminars with educators outside the field of agriculture. The seminar was a working and productive conference because individuals attending had interests in common and a desire to acquire information to upgrade programs.
38. Continue to accentuate the positive in the seminars and results for students. Include all levels of education in the seminars. Representatives from the colleges of agriculture are interested in the programs.

CONCLUSIONS AND RECOMMENDATIONS

Accomplishments

1. Even though vocational-technical education is not new, a philosophy for post high school programs has not been widely discussed. It is necessary for the people in the positions of leadership and responsibility to have a philosophy. The seminars were a step forward in concentrating on post high school offerings and a philosophy from which to formulate objectives, curriculums, and the tools with which to implement and strengthen programs. Those in attendance were the right people to continue spreading the information regarding vocational-technical education as related to post high school programs throughout the states.
2. Articulation - an excellent study was completed (Project No. 1988-13), at Cornell University in February, 1967, on Articulation of the Secondary and Post High School Programs in Agriculture in the Technical Colleges. Little time and effort has been devoted to this subject. The seminars made progress in this respect by actively bringing articulation to the forefront and doing something about the subject. The cross-section of participants from the states working in supervision, professors of agricultural education, heads of post high school programs, and faculty, made an opportune situation for the reslization that articulation between programs is essential for the smooth transition of students from secondary to post high school programs and to four-year colleges. Without this cooperative effort, there will be undue overlapping and gaps in our educational programs. The seminars brought educators with common interests and objectives in agricultural education together. All were concerned with providing the best programs possible for students at all three levels of instruction. It was decided that all educators would benefit from articulation meetings by (a) a better identification of agricultural occupations and opportunities for graduates, (b) curriculum development and how each level of instruction is related to the other, (c) the sharing of course outlines at all levels, (d) the necessity of placement tests and credit by examination for students progressing to the different levels and (e) the importance for cooperation of all agricultural educators -- since we are all in the same business, -- agricultural education.
3. Holding regional seminars made it possible to share the types and kinds of vocational-technical programs in operation and those now being developed in the United States. This was accomplished as much as possible through a series of slides used as a basis for discussion. An attempt was made to show (a) provision for laboratory application of subject matter learned in the classrooms, (b) technical education goes beyond manipulation activities - adequate library facilities and individual study activities are an essential part of technical education, (c) instructors are specialized in their respective

subject matter areas, (d) provision for quality of instruction as needed to equip students for successful entry into agricultural occupations, (e) how students become efficient and knowledgeable in using the equipment and instruments which they will be utilizing in industry, (f) how to provide students with the facilities and equipment they will find in industry, (g) that cooperative supervised occupational experience programs have a key place in technical programs in agriculture, (h) that youth organizations are serving a vital role in accomplishing the objectives of vocational-technical programs, (i) that in-service education for post high school instructors is an essential ingredient and should be provided by subject matter specialists working with the state and university staff, (j) that it may be possible to initiate new programs needed without new facilities, and existing facilities should be surveyed relative to their adaptability to programs being initiated or changed.

4. The seminars brought to the forefront the importance and the necessity for post high school instruction in agriculture and natural resources. The participation of directors of vocational-technical education, administrators, and other individuals not teaching agriculture, brought the programs into focus relative to their importance in education. It also opened the minds of many educators attending the seminars to look forward and use their vision for innovations and new ideas to develop needed curriculums for not only our present technologies, but also the vast field of expansion we are experiencing in emerging technologies. The seed was sown at the seminars for more knowledge about post high school programs in agriculture. At one of the seminars, Dr. Horner, University of Nebraska, made this statement regarding research: "It has been said that America is great because of its agriculture, its agriculture is great because of its education. The fact that agricultural education has been great is due in no small part to the systematic selection, preparation and improvement of its teachers. Not enough research has been conducted in identifying, recruiting, and preparing the best kind of potential teachers. Teacher preparation involves three aspects; generalizing, specializing and professionalizing." Research in the area of, or training programs for the future, were suggested in: (a) ways for faculty in vocational-technical programs to gain occupational experiences, (b) curriculum development as related to student needs, interests and abilities, with possible alternatives to give more flexibility to curriculums and still prepare students for employment entry. Vocational-technical programs for people with special needs -- a project to determine if graduates from vocational-technical programs accomplish the desired growth on the job - a study of the success of students graduating from technical programs and continuing in four-year colleges.

Recommendations (pg. 26)

21 5. More information on the placement of vocational-technical students and information as to what happens to the students after placement in the first position.

22 6. Faculty teaching loads in post high school institutions.

23 7. The use of visual aids, teaching devices, and teaching techniques in the post high school institutions, and how effective the use of these tools is in the learning process.

24 8. The exploration of the amount of cooperation between the various vocational-technical areas of disciplines and ways to encourage and implement a greater degree of cooperation.

25 9. Research on job classification and titles of agricultural occupations and natural resources and the related occupations requiring agricultural competencies. A finding of how these classifications are being used in collection of data, computers, and program development.

26 10. How data processing and computers can be used as tools for teaching agricultural occupations.

27 11. The exploration of the change in the family farms which are becoming larger and are sometimes involving more than one family on each farm,also corporation farming. How this change effects the education needed by owners, managers, and supervisors to perform the skills needed in farming.

28 12. Training programs, seminars or workshops in the future to cover a single aspect of post high school programs such as planning facilities; curriculum development; selecting, preparing, and retaining of faculty; youth organizations; the use of advisory committees; and supervised occupational experience programs.

Recommendations

1. Closer working relationships and more cooperation between the administrators of post high school vocational-technical programs in agriculture, administrators of other vocational-technical programs, and those responsible for teaching the academic courses.
2. A closer tie between the post high school programs in agriculture and the four-year colleges of agriculture.
3. Determine the objectives of programs in terms of the needs of the students to be served.
4. Conferences for agricultural teachers, -- seminars, workshops, and professional meetings. Involve educators from other branches of vocational-technical education and teachers in other academic fields such as the sciences and communications.
5. A greater use of advisory committees and careful selection of advisory members who are the successful, knowledgeable people in their field. The use of advisory committee recommendations for plans and policy-making (but the actual curriculum development, teaching and responsibility of the programs should rest with the professional agriculturalist.)

6. Communication skills, mathematics and sciences for vocational technical curriculums must be applicable to the technology. If academic teachers refuse to offer the applied instruction, agriculturalists must assist or find other means to accomplish this important part of the instructional program.
7. Keep in mind that some highly technical areas produce graduates working with the professionals and the scientists - and that there will be even a greater need for a level of understanding and communication on the scientific level. Technicians will have to communicate with peers as well as those under their supervision.
8. Transfer curriculums are the first two years of a four-year program, and should not be confused with technical curriculums. They cannot be one and the same and serve all students for all things.
9. The technical programs must be occupationally oriented.
10. The length of time for a curriculum is determined by the competencies required upon completion of the vocational-technical program. Most technical programs are by nature in-depth, and the amount of technical and related information required necessitates that they be at least two years in length.
11. More attention to be given to articulation between high school programs, post high school programs, and universities. This must be continuous and part of the "program of work" for all agricultural educators.
12. Planning for the post high school programs must be on a state level to prevent overlapping of programs and unnecessary duplication of facilities.
13. There appears to be undue friction over the transfer credit graduates from technical programs receive when continuing in four-year colleges. Transfer credit should be determined by the four-year colleges, according to the merits of the technical program. Even though the objective of technical education does not include transfer to four-year programs, high quality programs of a technical nature will have courses comparable to the four-year degree which will be highly transferable.
14. Educators in state and national positions of leadership should provide the organization to make a state and national youth organization for post high school programs available for those who desire to take part.
15. The better use of testing and counseling of students in the post high school programs to assist in determining goals, career selection and potential for future development.
16. That the professors of agricultural education in the universities visit post high school programs and discover teacher needs as they exist in the field. Professors of agricultural education are in key positions to make or break post high school programs, since the programs are dependent upon them for teachers. Therefore, a sound philosophy of vocational-technical education at the post high school level, teaching methods,and the application of principles in these institutions, innovations, and how to teach faculty in the post high school institutions to

have the learning process come about, in-service training and professional conferences with the post high school teachers, will be all important in making the programs successful.

17. Sabbatical leaves, leaves of absence, and provisions made for the instructors of the technical programs to gain work experience throughout their career. Also the opportunity for professional improvement by taking formal courses, visiting other institutions, and other means to keep abreast of changing technologies.
18. A better understanding by all teachers of the objectives of vocational agriculture, post high school programs, adult education, and the four-year colleges and research, so that all agriculturalists are working as a team in the business of agricultural education. Leadership on the part of state supervisors and professors of agricultural education to encourage and see that this type of an association exists.
19. In future seminars or workshops of this type, invite a greater variety of people outside of agriculture. Cross-fertilization of ideas is beneficial to all concerned.
20. A greater emphasis in the post high school institutions on follow-up of graduates.

Conclusions

The purpose of the seminar was accomplished by assemblying educators to combine their experiences and talents for the purpose of strengthening and establishing post high school programs in agriculture, the related occupations, and the natural resources. As agricultural educators, our job is agricultural education and the business of working with students. Changes in agriculture and in education are inevitable. The seminars will be far reaching with respect to having a part in planning for these changes and the future.

Instruction in agriculture is already in the process of changing with the formulation of larger comprehensive high schools in the country; vocational-technical schools at both the secondary and the post high school levels; and a rapid expansion of our community colleges, technical institutes and divisions of technology in the four-year colleges of agriculture. This process is strengthening vocational-technical agriculture in the high school by offering additional educational opportunities for many of the graduates who will enter the post high school programs. Many high school graduates will still continue direct entry into work positions as well as into the post high school institutions, and some high school graduates will enter directly into four-year colleges of agriculture.

There is no question but what the public is demanding supervised occupational experience for the students enrolled in vocational-technical education. The public is no longer willing to accept what has been established or successful in the past. We have to produce to meet present needs or be replaced. The change in the organization of the high schools is resulting in specialization with the vocational offerings in agriculture to include agricultural business, ornamental horticulture, mechanics, areas of conservation, forestry and other specializations. This is providing the opportunity for specialization on the part of the teachers and producing better instruction.

There is also a trend among vocational educators in distributive education, business, agriculture and other vocations to plan curriculums based on cooperation between various vocational programs. There appears to be more interest from all agricultural educators at the high school, post high school, four-year college and university level to work as a team and not separate on a status level. It is important that we, as educators, perpetuate this type of constructive thinking.

Farms continue to become larger, with capital replacing labor. This is increasingly placing more emphasis on management. With only a few of our four-year college graduates from the colleges of agriculture entering farming, a greater burden is being placed upon the post high school programs for adequate curriculum offerings to prepare young men for the business of managing the farms. A sound technical education will be necessary for farm managers of today and even more so for the future. Vocational agriculture is in a position to provide many of the skilled workers for our farms and many of these workers will continue their education and experience to become farm managers and owners.

We must always keep in mind the objectives of vocational and technical education. Educators have a tendency to sometimes up-grade more than the student is ready for, or more than industry will accept. It is difficult to keep a good vocational school vocational because of the pressure from academic-minded administrators or teachers. We find this same difficulty existing in a good quality program. There will be those who are interested in changing to a four-year curriculum, or something other than technical. If the objectives for your program are vocational or technical, the program should be operated to meet these objectives so that students are occupationally oriented and prepared for positions. The two-year colleges will continue to thrive and be recognized by the universities. They are already recognized and it is only in the minds of some faculty in the two-year colleges that they do not have equal status with those teaching in the universities. Those doing a good job in the two-year colleges have all the recognition and status they can use. They are respected by parents, students and other educators. As faculty in the post high school programs in agriculture think and act, so they will project themselves and be accepted in the field of education.

Administrators are usually interested in the best job possible for students. It is our job as agricultural educators to provide the facts for sound decisions in establishing programs. If this is carried out we can expect excellent support from non-agriculturalists as well as the agricultural industries. The quality and exclllence of a program will be judged on meeting objectives rather than its location in a high school, post high school or university. Now is the urgent time for all agricultural educators to work together for all programs. The reason for the emphasis on the post high school programs is due to the small number in existence in the country at the present time, relative to the need. Many community colleges, technical institutes and junior colleges are being established or are expanding. This is the time to establish agricultural programs at the post high school level as needed in the community to be served.

It may be necessary to change legislation in some of the states with regard to the area to be served by the community colleges. Sometimes the areas are too small geographically, and in student numbers, to support certain technical programs where the enrollment would naturally be low. This means the program would be prohibitive in cost. A few states now have legislation on the books to allow for the establishment of two-year colleges to serve the entire state for vocational and technical programs. This is advantageous in providing the funds, student numbers and scope for the technologies requiring a larger geographic area. There is also a definite advantage in that these two-year colleges are usually residential colleges providing dormitories and a complete college life for the students.

There is no question about the growth of the post high school programs in agriculturally related occupations and the natural resources. The seminars were attended by many educators who were deeply interested in agriculture and dedicated to providing the best possible programs of instruction at all educational levels. These men were men of enthusiasm who have had excellent experiences, and they represented a cross section of the United States. These are the kind of people who can respond to needs and will see that post high school programs in agriculture are developed according to the needs of the people in their states. The state supervisors of agriculture, professors of agricultural education and the professional agriculturalists are an exceptionally distinguished group of men who possess leadership abilities and the respect of their colleagues. These men will meet the challenge of post high school vocational technical education in agriculture.

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APPENDIX A

TO: Regional Program Officers
Chief State Supervisors of Agriculture
Teacher-Educators
Seminar Coordinators

FROM: Howard Sidney, Seminar Leader
Agricultural Technical Programs
Agricultural and Technical College
Cobleskill, New York 12043

SUBJECT: Regional Seminars on "Teaching Agricultural Occupations in Community Colleges and Area Vocational Schools"

Seminar Dates	States	Location and Coordinator
November 13,14,15 1967	North Dakota South Dakota Minnesota Wisconsin	Dell Hodgkins Area Vocational School Mankato, Minnesota 56001
December 11,12,13 1967	Michigan Indiana Ohio	James Pease Penta County Vocational School and Tech. College Oregon Road Perrysburg, Ohio 43551
January 9,10,11 1968	Iowa Illinois Missouri	Everett L. Clover Muscatine Community College Muscatine, Iowa 52761
January 31, February 1,2 1968	Alabama Mississippi Tennessee	Aubrey M. Briscoe Northwest Mississippi Jr. College Senatobia, Mississippi 38668
February 14,15,16 1968	Colorado Kansas Wyoming	Hilbert Kahl Northeastern Junior College Sterling, Colorado 80751
March 6,7,8 1968	Delaware Maryland New Jersey Pennsylvania West Virginia	Oscar Gustafson Potomac State College Keyser, West Virginia 26726
March 20,21,22 1968	Florida Georgia	Frank S. McCain Abraham Baldwin Agricultural College Tifton, Georgia 31794
April 11,12,13 1968	Arizona New Mexico Nevada	James Claridge Mesa Community College 1833 West Southern Ave. Mesa, Arizona 85201

Seminar Dates	States	Location and Coordinator
April 24,25,26 1968	Oregon Washington Idaho Montana	Earl M. McCullom Treasure Valley Community College Ontario, Oregon 97914
May 8,9,10 1968	Arkansas Louisiana Oklahoma Texas	Dr. A.C. Hughes, Head Teacher Department of Education East Texas State Univ. East Texas Station Commerce, Texas 75429
May 22,23,24 1968	New York Rhode Island Massachusetts Vermont New Hampshire Maine	Robert C. Kennedy Thompson School of Applied Science University of New Hampshire Durham, New Hampshire 03824
June 12,13,14 1968	South Carolina North Carolina Kentucky Virginia	Avron B. Upchurch Central Carolina Technical Institute Route 2, Box 27 Sanford, North Carolina 27330

APPENDIX B

INVITATION TO PARTICIPANTS

Dear

On behalf of Mr. Hunsicker, Chief, Agricultural Education, U.S. Office of Education, and your State Supervisors of Agriculture, I invite you to a regional seminar on "Teaching Agricultural Occupations in Community Colleges and Area Vocational Schools".

I am on leave for one year from my position as Chairman of Agriculture, Agricultural and Technical College, Cobleskill, New York to arrange seminars and workshops for educators interested in post high school programs for agriculture.

Community colleges, area vocational schools, and institutions offering post high school programs are being developed at a rapid pace. There is no question about the need for agricultural technical programs in a number of these institutions. It is our responsibility to provide leadership in program development for agriculture.

The enclosed statement and seminar agenda will explain the purpose and content of the seminar. The seminars are designed primarily for State Supervisors, teacher educators, administrators and heads of agricultural programs for agriculture. The enclosed roster will advise you as to those invited to the seminar. If you know other individuals who should be invited, please feel free to extend an invitation. Make all reservations directly with the seminar coordinator. Please invite your administrator or the person responsible for the vocational-technical programs in your institution.

We can all profit from the exchange of ideas. Therefore, I am asking each person to prepare a 5 - 8 minute statement for presentation to the group. Will you plan to speak on the subject of:

____

____

____

The seminar for your area will be held ____________________

for the states of: ______________________________

____

Location and coordinator: ____________________

____

____

____

____

Those attending will be asked to take care of their own travel and lodging expenses. Please send reservations to the seminar coordinator two weeks in advance.

Secretary for the seminars will be Mrs. Gary DeSormeau, here at Cobleskill, and her phone number is 518 234 5324.

I hope you will attend the seminar since we can strengthen vocational-technical agricultural programs by working together. I will look forward to meeting you in the future.

Sincerely,

Howard Sidney

Howard Sidney, Seminar Leader
Agricultural Technical Programs

HS/ad
Enc.

APPENDIX C

EXAMPLE OF ROSTER

METHODS OF TEACHING AGRICULTURAL OCCUPATIONS IN COMMUNITY COLLEGES AND AREA VOCATIONAL SCHOOLS

COMMERCE, TEXAS

May 8, 9, 10, 1968

States: Arkansas
Louisiana
Oklahoma
Texas

Seminar Coordinator: Dr. A.C. Hughes, Head
Department of Agriculture
East Texas State University
East Texas Station
Commerce, Texas 75429
214 468 2691

Lodging: Sage Motel
Campbell Highway
Commerce, Texas 75428
214 886 2161

or

Holiday Inn
Greenville, Texas 75401

or

Continental Inn
Greenville, Texas 75401

Please use the enclosed card to contact Dr. Hughes for a reservation. Dr. Hughes will notify those attending as to their motel reservations.

Please contact Dr. Hughes as early as possible for reservations.

Seminar Location: Sam Rayburn Memorial Student Center
Room 207
East Texas State University

Registration: May 8, 1968 10:30 A.M.

State of Seminar: 11:15 A.M.
Closing: May 10, 1968 3:00 P.M.

ROSTER

Arkansas Louisiana Oklahoma Texas

ARKANSAS

George F. Sullards, Director
Agricultural Education
Division of Vocational Education
State Department of Education
Education Building
Little Rock, Arkansas 72201

Denver B. Hutson, Head
Division of Vocational Teacher Education
University of Arkansas
Fayetteville, Arkansas 72701

Olen P. Nail, Dean
College of Agriculture and Professor
of Agricultural Education
Arkansas State University
State College, Arkansas 72467

R.C. Haynie, Associate Professor and Head
Arkansas Agricultural Mechanical and
Normal College
Pine Bluff, Arkansas 71601

Dr. Sellers J. Parker, Dean
Agricultural and Technology
Agricultural, Mechanical and Normal College
Pine Bluffs, Arkansas 71601

Denver Nettles
Arkansas State University
Beebe, Arkansas 72012

Malvern Watson
Arkansas Polytechnic College
Russellville, Arkansas 72801

William Stanley, Director
Delta Voc-Tech School
Marked Tree, Arkansas 72364

Luther Hardin, Director
Foothills Vocational Technical
School
Searcy, Arkansas 72143

APPENDIX D

PROPOSED AGENDA

Methods of Teaching Agricultural Occupations in Community Colleges and Area Vocational Schools

1st Day	10:30 - 12:00	Registration and orientation
	12:00 - 1:00	Lunch
	1:00 - 2:30	Purpose of seminars Objectives for vocational and technical programs
	2:30 - 2:45	Milk - Coffee break
	2:45 - 4:15	Determining need for agricultural technical programs Evaluation of proposed seminar agenda
	5:00 - 7:00	Dinner
	7:00 - 9:00	Planning and developing curricula Short courses Vocational programs Technical programs Two year degree programs Transfer programs
2nd Day	7:30 - 8:30	Breakfast
	8:45 - 10:15	Planning and Conducting Instruction Course outlines and content Classes and lectures Laboratory instruction Field trips
	10:15 - 10:30	Milk - Coffee break
	10:30 - 12:00	Instruction - Occupational Experiences Need for occupational experiences Specialized laboratories Cooperative work programs Examples of programs in operation
	12:00 - 1:00	Lunch
	1:00 - 2:30	Youth Activities Purpose and need for activities Types of organizations Relationships to other organizations

	2:30 - 2:45	Milk - Coffee break
	2:45 - 4:15	Tour of Institution Facilities Instructional programs Administrative arrangement for agricultural programs
	5:00 - 7:00	Dinner
	7:00 - 9:00	Facilities for Agricultural Technical Programs Classrooms and laboratories Offices and storage area Farm, livestock, greenhouse
3rd Day	7:30 - 8:30	Breakfast
	8:45 - 10:15	Faculty for agricultural technical programs Experiences in business Recruitment of faculty Retention of capable faculty In-service improvement Rapport with general education faculty Rapport with administrators
	10:15 - 10:30	Milk - Coffee break
	10:30 - 12:00	Implementing and supporting agricultural technical programs Student recruitments High school administrators and faculty Universities and Four Year Colleges Political leaders General public Advisory Committees Local Institution Administrators
	12:00 - 1:00	Lunch
	1:00 - 2:30	Guidelines for agricultural technical programs
	2:30 - 2:45	Milk - Coffee break
	2:45 - 4:15	Summary Meeting current needs Programs for future Evaluation of seminar Follow-up of seminar
	5:00 - 7:00	Dinner
	7:00 - 9:00	Informal Discussion

APPENDIX E

SEMINAR COORDINATOR

To: Seminar Coordinator

From: Howard Sidney

Subject: Coordination of Seminar

Now that you have completed all arrangements for the seminar at your college, I am listing for your convenience, a check list of the things which will need our attention:

1. Inform the college business office and motel office of seminar location.
2. Provide for registration at 10:30 a.m. and the starting of the seminar at 11:15 a.m. At this time the coordinator will make announcements as necessary.
3. Arrange for the lunches and dinners or recommend restaurants so that we can keep the group together. Arrange for a suitable milk and coffee break each day according to the situation.
4. A meeting room for Wednesday, Thursday and Friday. Would like to arrange the room conducive to an informal discussion, so that all individuals will be involved.
5. Provide a slide projector, screen, overhead projector, blackboard and podium. A public address system if necessary. I will meet with the coordinator prior to the seminar, to discuss the final plans.
6. The coordinator conduct a tour of the college facilities.
7. Keep me informed of individuals attending the seminar who should be recognized or will be on the program.
8. Other factors, adjustments or changes which the coordinator deems advisable for his situation.

APPENDIX F

TEACHING AGRICULTURAL OCCUPATIONS IN COMMUNITY COLLEGES AND AREA VOCATIONAL SCHOOLS

CURRICULUM DEVELOPMENT FOR TECHNICAL EDUCATION

A curriculum to educate a technician is the organized program of study designed to meet the specific requirements and objectives of preparation of that particular kind of technician within a stated period of time.

The curriculum must be designed specifically to prepare each type of technician. The courses in the curriculum for educating technicians can usually be grouped as follows:

1. Basic science and mathematic courses as a basis for the application of technical courses.
2. Technical specialty courses and supporting studies which teach the skills, knowledge, techniques, procedures, materials, processes, apparatus, operations, and services which distinguish the technology from others.
3. Communication courses which teach oral, written, and graphic communication skills.
4. Social Studies and courses which provide the technician with an informed frame of reference in economics, citizenship, social relationships, a member of a family in the society in which he lives.

The curriculum for any high quality technician educating program must be based on the assumption that certain fundamental required information and resources are available, and will be completely operative in the program. This includes a clear and complete definition of the special abilities that the technician must have, and in context with the nature and level of those abilities, the activities he must be able to perform, and with whom he works. The curriculum must have the institution's total administrative support which uncompromisingly provides the organizational, financial, and philosophical resources necessary to obtain the objectives of the program.

Adequate physical facilities must be available and suitably equipped to meet all of the requirements of the program, and available when needed for the instructional program. An "absolute must" is a highly qualified, willing, and enthusiastic college level instructional staff, capable of teaching all of the specific knowledge, skills, concepts, and competencies at the level required for the technician.

The students in the curriculum must be of at least average ability and meet the required prerequisites for entering the program. They must exhibit a seriousness of purpose and nature, and mature interest, motivated by a desire to succeed in the program. Weakness in any one of these factors will lower the quality of the preparation of the technicians it is designed to educate, and to that extent, prevent the attainment of the objectives of the institution and of the students who seek the advantages of this program. (8)

The technical curriculum will have unique content and will involve learning experiences which distinguish it from the specific curriculum for other education objectives, but it will have many characteristics in common with all technician educating curriculums. The technical education curriculum must be of college level and intensity. To be administerable, the total learning program must be divided into a series of courses in which all that must be learned may be most advantageously taught.

The length or duration of the program is a vital and limiting factor in designing the curriculum. Experience indicates that technical programs usually can be accomplished in a minimum of two academic years of approximately nine months each, and can effectively prepare students for successful competitive employment as beginning technicians. The preparation of some agricultural technicians may require that students use the summer period or even additional time for occupational experiences in the industry.

Because of the short duration, a loose collection of courses which may be taken at random, and independent of one another, cannot be considered as adequately educating technicians. The sequence of courses in a two-year technical curriculum is as important as the content of the courses.

Generally, the subject matter in the curriculum should be carefully coordinated in groups of concurrent courses which are arranged to blend smoothly from one group of courses to the next, thus carrying the student to a deeper understanding in the many diverse areas of his field of specialization. This is in sharp contrast to the arrangement of the usual professional curriculum in which basic and somewhat unrelated courses make up the first two or three years of study, and specialization is deferred.

The relationship between laboratory time and class lecture and demonstration of theoretical study time is of great importance in a technical education curriculum. All of the theory, skills, techniques, applied principles, materials, related knowledge, processes, special services, and understandings needed by the technicians could be taught in the laboratory with suitable explanations by instructors without separate and organized theoretical classes. Laboratory experience, skills, "know-how", and capabilities which are the most characteristic attributes of technicians cannot be learned in classrooms without laboratories. The organized and related ideas, concepts, and factual information can be taught in classes using demonstrations, visual aids, selected textbooks, and references requiring regular and systematic outside study on the part of the student. The typical technical curriculum provides a relatively large proportion of time for laboratory hours in the technical specialty during the first two semesters. Therefore, introductory and elementary laboratory skills and knowledge of apparatus, tools, processes, materials, devices, and good practice can and should be learned in the laboratory as early as possible, and can be started without much underlying theory. In addition, it tends to maintain and heighten the student's interest and satisfaction if he can begin studying his specialty immediately. This develops the student's understanding of laboratory work, and therefore results in the student having an increasing depth of understanding of the subject being taught.

Experience in technical education has shown that the semester hours of science and technical specialty laboratory work should be equal to or greater than class theory hours, and usually should not be reduced below this level in technical curriculums. Such a reduction usually causes the typical student to lose interest and to fail or abandon the course, or it produces a graduate who is deficient in the absolutely essential laboratory capacities. This student is, therefore, untrained for his occupational objectives, and is unemployable at the technician level.

In technical curriculums, it is mandatory that specialized technical course work be introduced in the first semester. Deferring this introduction even for one term imposes serious limitations on the effectiveness of the total curriculum. Several important advantages occur from an early introduction of technical specialties.

1. It provides motivation. Since the student is enrolled in the school to study a particular technology, it is important to start this training immediately in his specialty. When the first semester consists entirely of general subjects such as mathematics, English, General Science, and Social Studies, technical students often lose interest.

2. By introducing the technical specialty in the first semester it is possible to achieve greater depth of understanding in specialized subjects in the later stages in the two-year program.

3. The student sees immediate application of the principles he studies in the basic science and related mathematics courses which he is studying concurrently. (8)

Careful examination of successful technical curriculums in agriculture show the relationship of the basic biology, chemistry and necessary supporting mathematics to the specialized application of science that underlie their particular field of biological science and because of limits of time relatively few of the total curricula hours are devoted to purely Science subjects.

Typical curriculums are attached. (8)

The courses which provide the basic science content for any technical curriculum should be application oriented, rather than deeply theoretical, but should provide enough of the fundamental theory of science to permit the student technician to comprehend new developments in the fields as they effect his specialty, and to form the base for further study in the applications of the basic science. (8)

Mathematics is a basic tool which is required in varying degrees and depths for all kinds of technicians according to the competencies needed for that occupation. Curriculum development for technical programs must be considered as a continuation of high school experiences.

It is evident from current studies that students who have been enrolled in high school curriculums in vocational areas will matriculate in increasing numbers in the technical college programs, therefore, in essence, the high school curriculum may be pre-technical in nature. The skills, competencies, and understanding developed in the high school provide a base for technical education. This necessitates a close working relationship between those in high school education and the faculty teaching technical education. Teachers in each phase of our educational system must share information and be informed as to the curriculum content if we are to strive for the best results for the students.

As the level of instruction changes in the high school, it will effect the beginning courses in technical programs. Some of the courses in the technical college must be omitted or adjusted as a result of changing high school instruction. It is imperative that the faculties of our high schools, technical colleges, and four year colleges work closely together if we are going to have an effective program of instruction for the students.

Curriculum Content Guideline (4)

GUIDELINE: Curriculum content for agricultural technician training programs should be closely related to present and future occupational needs.

Therefore:

a. Curriculum content should be primarily occupation-centered.

b. A balance between technical-supporting content and class-laboratory experiences is essential for learning concepts and principles and their application.

c. Preliminary drafts of curriculum content should be developed through a study of the present and future job requirements in the occupational fields selected and the allocation of the required knowledge, skills, and understandings to courses of instruction.

d. The depth and scope of mathematics and science must be tailored to the occupational needs of those enrolled.

e. The difficulty level should be such that it can be mastered by a reasonably high proportion of the students within the time limits of the curriculum.

f. The curriculum should be flexible enough to be easily revised as needed in advance of the changing competencies of the technician.

g. Curriculum content should be planned with advice, counsel and support of the agricultural industry for which the training program is being developed. Other agricultural education leaders should also be involved.

h. The curricula for the agricultural technician training programs should be coordinated with the total institutional program.

GENERAL EDUCATION COURSES

The technical curriculum can be primarily developed by the agricultural staff. This should be done by counseling with other departments. The General Education courses should be developed through the curriculum committee representing others in the college who are responsible for the General Education courses. This committee will vary from school to school, but generally consists of representatives from the Office of Instruction, Admissions, Chairmen of the English, Mathematics, Science Departments, and those responsible for General Education in the school.

This brings together not only the instructional content, but also other problems which may arise concerning budgets, new equipment, new courses, library, new books, audio-visual equipment, short courses, evening division, and the total scope of the institution.

After developing the technical content of the curriculum, the next step is to develop the general education content. One of the most common comments made by employees and employers from a study in California showed the concern for communications. Employers especially want employees who can write and speak effectively. Many of the technicians expressed the need to know how to write a clear, concise report. We must consider the future of technical graduates as individual members of our society. If a quality program of technical education is desired, the graduate should be able to find employment and perform the necessary skills to be competent. He also needs to be able to get along with his fellow workers and others in our society. He needs to understand our form of government and how it was evolved. He needs to learn to employ his leisure time in an intelligent and satisfying manner. General Education courses should be planned with these facts in mind.

Considerable variation exists in the amount of General Education required by states and local boards. The curriculum committee or school administrators will need to consider the selection of course content and teaching personnel. If the teachers of the General Education courses do not have a philosophy which is understanding and sympathetic toward the technical student, there may be a real deterrent to the program. These teachers should be able to accept realistic objectives for the students and put the emphasis on effective teaching. The technical and General Education areas are both important to the curriculum. A good program cannot result unless there is cooperative effort between the two groups.

A typical breakdown of technical curriculums shows 30 to 50% of the student's time devoted to General Education courses, 40 to 60% of the time for technical specialty courses, and 0 - 10% allowed for elective courses. The only exception to this appears to be in the livestock and crop production technologies. Due to the diverse number of courses required in Farm Management, frequently up to 60% of the instructional time is devoted to the technical courses.

There will be separate discussions during the seminar on short courses, vocational programs, and the parallel transfer curriculum.

APPENDIX G

METHODS OF TEACHING AGRICULTURAL OCCUPATIONS IN COMMUNITY COLLEGES AND AREA VOCATIONAL SCHOOLS

FACULTY

A highly trained, experienced, technically competent, and enthusiastic instructional staff is necessary for the success of any technical program.

A teacher cannot change from vocational education to technical education without a clear understanding of the basic principles and philosophy of technical education. Technical education cannot be a continuation of high school, and it is not the same as most four year programs. Therefore, faculty require special preparation, interests, and appreciation for technical education to be able to accomplish objectives in working with students. Teachers of technical curriculums must gain experience by closely coordinating their particular course content with the other faculty members who are teaching courses in the curriculum. They must develop course sequences, materials, terminology, and have a total presentation for the curriculum.

To be effective, members of the faculty responsible for technical programs must have interests and capabilities which exceed their area of specialization. All of the faculty members must be reasonably well oriented in the requirements for study in the particular technology, and its applications, so that they may use pertinent examples of subject matter as a point of departure for supporting materials as they teach their respective courses. Faculty must be able to use the various scientific principles when students need them in courses, to emphasize and illustrate practical applications.

The experience needed by technical faculty has important implications for the organization of the faculty to teach technicians and also for early in-service training for new teachers. We must have faculty who can master their subject matter, with a background substantially broader and with greater depth than the subject content which they will teach their students. This greater depth and breadth of subject is needed to provide the teacher with the complete comprehension of his subject so he can imaginatively teach its various concepts, facts, and aspects at the technical level with confidence. Recent experience has shown that graduates of high quality technical education programs who have acquired suitable employment experience and who have continued their technical education to the professional level often become excellent teachers in this type of program. Unfortunately, there is an acute shortage of faculty with this preparation. People with this background are more likely to understand the objectives and unique instructional requirements of technical education. Faculty with this background are liable to bring enthusiasm and appreciation of the values and characteristics of technical education to the program and this is very essential for success. This source of technical specialty faculty may become increasingly important because of the trend toward more and more theory and less and less laboratory oriented experience in most of the programs for educating professional teachers.

Colleges now operating technical programs in agriculture should carefully evaluate their students as prospective faculty and encourage those who should to continue their professional education and enter the field of teaching in the technical institutions. The greater emphasis on theory which I have mentioned usually does not prepare the recent graduate for the new curriculums to be either educationally or psychologically capable of teaching technicians, because he has not learned and practiced in detail the skills, procedural competencies, and special techniques of services required of technicians. It is possible that teachers whose preparation is comprised of large amounts of study of professional education and who have not acquired competency in their subject specialty in depth would not be qualified to teach technical courses even though their academic credentials may be impressive.

The experience qualifications for teaching in programs for technicians are important for all of the teaching staff and for all teachers of the technical specialty courses. There are special requirements. Employment experience recent enough to be valid and representative of current practice, either as a professional or a technician involving extensive experience with the skills and competencies he will teach, is almost mandatory. The duration of this employment experience should be sufficient for him to develop the skills, related judgments, and capabilities expected of the technician in this field.

It is easy for faculty of technical programs to get out of date and therefore this experience, as well as professional courses, should be evaluated and considered as part of the in-service training of faculty.

One of the most personal qualifications required of the instructional staff of a technical program is that he be able to teach effectively in his environment and toward the objectives of educating technicians. This requires that they exhibit acceptable attitudes and that they are capable of inspiring their students to be enthusiastic and to have the desire to master subjects for which the teacher is responsible.

Research, as it is associated with the discovery of new theoretical knowledge, is not usually the concept or preoccupation of faculty of technical educating programs, therefore, the absorption of the interest of a teacher of technicians to do such research is not required, nor is it usually desirable. However, continuous study of new methods and development of new materials for teaching or of current development in the field of his specialty are necessary attributes. (8)

When an institution has been in operation long enough to have graduates, the technical assistants, laboratory assistants, and staff working with the students should be selected from the technical programs. A careful selection of assistants who have graduated from the technical program can mean having assistants who understand the program and who have the correct attitude and philosophy toward the instructional work.

Teaching loads for faculty must be considered. Those teaching technical specialty courses should be given special consideration as to student contact hours, number of students, and the total schedule. Fully effective instructors in these special areas of education require a considerable amount of time to develop really effective lecture, demonstration and laboratory materials than do regular "shop instructors" or some teachers of General Education courses. A contact hour workload of 15 to 20 hours per week usually constitutes a full teaching load for those in the agricultural sciences and technical specialty faculty. The rest of their time should be devoted to assisting students, course development, organization of facilities and laboratories, examinations, other classroom activities, curriculum development, advising or counseling students, and public contacts with the industry the technology is related to.

In selecting the teaching faculty, consideration should be given as to the preparation and source of faculty. It is ideal to have a faculty from as diverse an educational and employment background as possible, so as to provide a variety of attitudes, experience, and outlook for the students. Employment of most of the faculty who graduated from a particular institution or gained work experience in the same employment pattern tends to limit the program, and should be avoided.

Professional improvement should be given continuous attention. Technological changes in the various technical programs is rapid, and certain to occur. Faculty must be encouraged to keep their knowledge current of both the scientific changes and the details of the techniques, procedures, and applications in the industry. They must also be constant students of teaching techniques and innovations in the teaching profession in the specific field. Faculty should be encouraged toward personal improvement activities. This can be in many directions, such as participation in activities of societies, short periods of employment in industry, observations of other successful faculty outside of the institution, and formal courses at the university centers. Sabbatical leave or other grants of time must be provided for faculty outside of the institution, and formal courses at the university centers. Sabbatical leave or other grants of time must be provided for faculty to keep up-to-date.

More special intensive summer institutes or one-semester or one year programs should be devised to enable teachers to keep up-to-date. Arrangements should be made so that they can attend state universities outside their own states and programs should be made available to more of our educators in technical programs.

There is much more to be said about the selection of faculty, development of in-service training programs, retention of faculty, and programs for training faculty for technical education. It is possible that more of the teacher-education centers in the colleges and universities will become interested in preparing faculty for technical education and also for in-service training, by working cooperatively with the agricultural engineering, farm management, ornamental horticulture departments, or whatever is needed.

The professors in agricultural education would be able to provide the in-service training needed by our faculty. This will require an interest and understanding on their part of technical education for agriculture.

APPENDIX H

METHODS OF TEACHING AGRICULTURAL OCCUPATIONS IN COMMUNITY COLLEGES AND AREA VOCATIONAL SCHOOLS

FACILITIES

The physical plant must be adequate for efficient conduct of the educational program in accordance with the objectives.

In overall planning, consideration must be given to adequacy, effectiveness, maintainance, location, and types of buildings, and should include provisions for safety, classrooms, laboratories, staff offices, parking facilities, a library, recreation areas, student services, dormitories (if needed) and specialized laboratories according to programs such as farm, livestock, greenhouses, forest, food processing, as well as consideration for change and expansion in the future.

Some programs to educate technicians, particularly in the agricultural field, require extensive and highly specialized laboratories such as the nursery area for Ornamental Horticulture -- feeding and milking facilities for dairy herds -- production technology for the timber management area required for forestry technology. These facilities must be planned to provide the necessary elements of educational experience and exercise, to meet the objectives of the particular technical program. It is usually desirable to have classrooms near the laboratories.

Laboratories and equipment for teaching technical programs must meet high standards of quality since the objectives and the strengths of the programs lie in providing valid laboratory experience, -- basic in nature, broad in variety, and intensive in practical experience. Well-equipped laboratories with sufficient facilities for all students to perform the laboratory work are required for specialized courses.

The training program should include experiences which illustrate the function and application of principles using as wide a variety of components, devices, systems, procedures, and techniques as practical and consistent with what may be encountered by the technician when he is employed. Variety and quality equipment and facilities are more important than quantity.

Laboratory equipment and facilities are a major element of the cost of such a program, and they are indispensible if the training objectives are to be met. Equipment for specialized laboratories for any technical program should be selected by the technical specialists who head the program and teach it. When specifying and selecting laboratory equipment, the need for each item should be well established. Expensive apparatus may not always be required. Many significant experiments can be performed and learned with relatively inexpensive equipment.

Throughout the program the emphasis should be on the basic underlying principles which serve as the basis for the applications in the specialized field, to develop an understanding of as well as the skillful performance of, the techniques peculiar to that particular technology. When using demonstration or stimulation equipment to teach principles, it is essential that real apparatus (typical of that used in employment situations) be used so the student may complete his learning experience. It is not enough to demonstrate the principles clearly. The student must see and understand the principle as applied to the standard apparatus currently used in the technology. He must learn to use and be able to manage the technical skill with competence.

It may be possible to use equipment in cooperation with other programs. Joint use of equipment requires carefully coordinated planning with the other departments involved, since it is essential that each department has sufficient equipment for its own needs, at the time needed, for each program.

In addition to providing the initial equipment, it is also necessary to have an annual equipment and supply budget. These funds are necessary to replace or repair equipment, to purchase new equipment to meet modifications and changes in the program. No program can meet its technical education objective with obsolete laboratories and equipment.

Library

The growth and success of the graduate technician will depend in a large measure on his ability to keep abreast of the changes in the field. After he is employed as a technician he will be expected to obtain information for himself without supervision, and therefore must be experienced in using a library. A central library under the direction of a professional librarian contributes much to the success of teaching technological programs. The library is therefore a part of the instructional facilities and resources for every course in every technical curriculum. How the library organizes its materials is less important than what it contains and how often and how well the material is used.

The library must contain a minimum of scientific and technical books, references, periodicals, publications of suppliers, journals, and visual aids, all pertinent to the technical field. Acquiring and maintaining the books, periodicals, films, et cetera, must be a continuous preoccupation of the library staff and the teaching faculty, since the library is an integral part of the teaching facilities and services for each course. The faculty should give the library assistance in seeing that the necessary publications are available for the curriculum.

A two-year institution of up to 1000 students cannot discharge its mission without a carefully selected collection of at least 20,000 volumes, exclusive of duplicates and textbooks. Junior colleges with broad curriculum offerings will tend to have a larger collection. Usually we can expect from 200 to 400 timely pertinent technical college level books and references-available to support the group of specialized courses for a technology. This does not include pamphlets, government publications, and other references.

Students in technical curriculums must study books on the emphasis and application of physical or like sciences which comprise their specialty. The related and supporting courses in basic science and mathematics also emphasize applied science and applied mathematics for the technician courses.

The world of the technician is one of doing and applying theory as the member of a team which includes professional scientists, and he needs managerial ability to operate his own business.

The professional staff must give careful thought and considerable planning to develop the facilities and equipment necessary for a technical curriculum, closely related to the objectives of the curriculum and the skills and competencies which the students will have to acquire.

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